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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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David K. Booth

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STOEL RIVES LLP  
900 SW FIFTH AVENUE  
SUITE 2600  
PORTLAND, OR 97204-1268

EXAMINER

STONE, JENNIFER A

ART UNIT

PAPER NUMBER

2636

DATE MAILED: 10/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/645,354

Applicant(s)

BOOTH ET AL.

Examiner

Jennifer A. Stone

Art Unit

2636

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 4-6, 8, 15 and 22-35 is/are allowed.
- 6) ☒ Claim(s) 1-3, 7, 9-13 and 16-21 is/are rejected.
- 7) ☒ Claim(s) 14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

***Claim Rejections - 35 USC § 112***

1. The rejections to claims 9 and 14 are withdrawn due to the Applicant's explanation of "surface normals".

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-3, 7, 9-12, and 18-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Kadwell et al. (US 6,876,305).

For claim 1, Kadwell discloses a rapidly responding, false detection immune smoke detector of a light obscuration type, comprising: a light source from which a light beam propagates; a light detector having a light receiving surface with a light detecting area and producing a signal in response to light incident on the light receiving surface (col 2, Ins 42-45; Fig. 2A); and a light reflective imaging assembly in optical association with the light source and the light detector, the imaging assembly including first and second spaced-apart optical components having respective first and second opposed light reflecting surfaces forming between them a spatial region that smoke particles can occupy (col 2, Ins 46-56; col 9, Ins 56-61; Fig. 2A, item 220, 202), the first and second

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optical components having light directing properties that cooperate to reflect the light beam between the first and second light reflecting surfaces and to direct the light beam toward the light detector for incidence on its light receiving surface (col 12, Ins 48-53), and the first and second optical components controlling the light beam by providing it with a beam width that is sufficiently wide to render insignificant contributions of anomalous light reflections but that converges to illuminate the light receiving surface within the confines of the light detecting area and thereby cause the light detector to produce a signal corresponding to a concentration of the smoke particles occupying the spatial region (Fig. 5B, 5C; col 34, Ins 59-63; col 36, Ins 46-58; Fig. 11, 12, and 15).

For claim 2, the smoke detector comprises a rate of change measurement detector operatively associated with the light detector to measure a rate of change of the concentration of smoke particles occupying the spatial region, the rate of change measurement detector responding to the signal produced by the light detector to determine an elapsed time between changes in concentrations of smoke particles between first and second smoke concentration threshold levels (col 4, Ins 54-61; col 5, Ins 1-5; col 35, Ins 20-24 and 40-46).

For claim 3, Kadwell discloses a first smoke concentration threshold level is less than the second smoke concentration threshold level and the rate of change measurement detector produces a signal indicating that a rate of rise of the concentration of smoke particles from the first smoke concentration threshold level to the second smoke concentration threshold level has exceeded a first predetermined threshold rate and the concentration of smoke particles persists above the second

smoke concentration threshold level for a predetermined time (col 35, Ins 1-7, 16-19, 20-24, and 30-36).

For claim 7, Kadwell discloses one of the first and second light reflecting surfaces (Fig. 1B, item 27) includes a pair of openings (Fig. 1B, item 31A,B), the light beam emitted by the light source propagating through one of the pair of openings and the light beam received by the light detector after incidence on the first and second light reflecting surfaces propagating through the other one of the pair of openings (col 11, Ins 54-63).

For claim 9, Kadwell discloses opposed first and second light reflecting surfaces that have surface normals and in which the first and second light reflecting surfaces are positioned so that their surface normals are parallel to each other (col 11, Ins 54-63; Fig. 1B, 1C, item 27).

For claim 10, the first light reflecting surface is curved (Fig. 4A, item 402), the first optical component has an opposite surface (Fig. 4A, items 410 and 404), and the light source and the light detector are positioned in proximity to the opposite surface of the first optical component (Fig. 4A, items 414, 418; col 14, Ins 32-50).

For claim 11, the first and second light reflecting surfaces are curved (col 9, Ins 56-60).

For claim 12, the first and second optical components have an opposite surface (Fig. 4A, items 410 and 404), and one of the opposite surfaces is positioned in proximity to the light source and light detector (Fig. 4A, items 414, 418; col 14, Ins 32-50).

For claim 18, the light source includes a light emitting diode (col 9, Ins 60, 61).

For claim 19, the light-emitting diode emits light having a wavelength of less than about 800nm (col 32, Ins 11 and 12).

For claim 20, Kadwell discloses a wavelength range of between about 350nm and about 470nm (col 32, Ins 4-7).

For claim 21, Kadwell discloses the light reflective imaging assembly in the form of an integral unit (Fig. 4A).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 13, 16, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadwell, as applied to claim 1, and further in view of Beiser (3,748,014).

For claim 13, Kadwell discloses using plano and concave optical surfaces, but does not specifically mention that one of the first and second reflecting surfaces is in the form of a concave optical surface and the other of the first and second light reflecting surfaces is in the form of a plano optical surface; however, Beiser discloses this feature (Fig. 3A, items 16' and 20'; col 5, Ins 58-60; col 6, Ins 17-19). It would have been obvious to one of ordinary skill in the art, at the time the invention was made to use a

concave mirror to decrease the amount of optical losses due to multiple surface reflections.

For claim 16, Kadwell does not disclose an optical axis; however, Beiser discloses an optical axis (Fig. 1 – axis) that extends between a first and second reflecting surfaces (Fig. 1, items 12, 14, and 16) and in which, for at least one of the first and second light reflecting surfaces, the multiple reflections undergone by the light beam take place on both sides of the optical axis (Fig. 1, items A-K). It would have been obvious to provide beams outside an optical axis to increase the scanning area.

For claim 17, Kadwell does not reflect multiple light beams off the first and second reflecting surfaces; however, Beiser discloses this feature (col 3, lns 38-45). It would have been obvious to provide cyclical endpoints or multiple light beams in order to increase scanning magnification.

### ***Allowable Subject Matter***

6. Claims 4-6, 8, 15, and 22-35 are allowed.

Claim 14 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Response to Remarks***

7. Applicant's arguments filed September 13, 2005 have been fully considered but they are not persuasive.

The Applicant argues as follows:

Kadwell fails to disclose a smoke detector that includes first and second spaced-apart optical components having respective first and second opposed light reflecting surfaces.

The Applicant interprets "opposite" to mean "situated in pairs on an axis with each member being separated from the other by half the circumference of the axis" as defined in Webster's Ninth New Collegiate Dictionary (1989) and interprets the circumference of the axis upon the situation of mirrors as in Kadwell, Figure 2A, items 202, 204, 206, 208, 210. However, the Applicant has chosen one of numerous definitions of the word "opposite" and applied it to figure 2A. The examiner, on the other hand, uses definition 1a from Webster's Tenth New Collegiate Dictionary (2001): "set over against something that is at the other end or side of an intervening line or space". In this case the intervening line is the dashed light beam of figure 2A. Therefore, Kadwell does disclose a smoke detector that includes first and second spaced-apart optical components having respective first and second opposed light reflecting surfaces.

### ***Conclusion***

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not



mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A Stone whose telephone number is (571) 272.2976. The examiner can normally be reached on M-F from 8:00am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey Hofsass, can be reached at (571) 272.2981. The fax phone number for the organization where this application or proceeding is assigned is (571) 273.8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jennifer Stone  
October 3, 2005

1.



JEFFERY HOFSSASS  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600